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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NGUYEN, TU MINH	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,024	KELLEY ET AL.	
	Examiner	Art Unit	
	Tu M. Nguyen	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. An Applicant's Request for Reconsideration filed on December 22, 2005 has been entered. Overall, claims 1-18 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 6-12, 14, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirth (U.S. Patent 4,765,803).

Re claims 1, 6, and 10, as illustrated in Figures 1-3, Hirth discloses a method and an apparatus of agglomerating particulate matter in a gas stream, the method comprising:

- dividing a flow of exhaust gas into at least two streams (3) of the gas, each gas stream including particulate matter;

- positively charging the particulate matter in one (3) of the at least two streams of exhaust gas;

- negatively charging the particulate matter in the other (3) of the at least two streams of exhaust gas; and

- combining the stream of exhaust gas having the positively charged particulate matter with the stream of exhaust gas having the negatively charged particulate matter (in a common passage (2)).

Hirth, however, fails to specifically disclose that the gas stream is exhaust gas from an internal combustion engine.

Hirth discloses the claimed invention except for applying the invention to an exhaust gas stream of an engine. It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the invention of Hirth to a purification system to remove particulate matter from the exhaust gas stream of an engine, since the recitation of such amounts to an intended use statement. Note that an internal combustion engine generates exhaust gas that contains harmful emissions of particulate matter that require purification before the gas can be released to the atmosphere; and the mere selection of the apparatus of Hirth for use in a purification system of an engine would be well within the level of ordinary skill in the art.

Re claims 3, 4, 8, and 9, in the method of Hirth, the particulate matter in the one stream (3) of exhaust gas is positively charged by applying a positive voltage thereto and the particulate matter in the other stream (3) of exhaust gas is negatively charged by applying a negative voltage thereto.

Re claims 12 and 14, in the apparatus of Hirth, the charging device (13) includes a plurality of positive electrodes disposed in the first exhaust conduit and a plurality of negative electrodes disposed in the second exhaust conduit.

Re claim 15, the apparatus of Hirth further includes a first ground disposed in the first exhaust conduit and a second ground disposed in the second exhaust conduit (as shown in Figure 2).

Re claim 17, the apparatus of Hirth further includes a ground disposed at the junction.

Re claims 2, 7, and 11, the method and apparatus of Hirth disclose the invention as cited above, however, fail to disclose that the method further includes passing the combined stream of exhaust gas through a particulate matter trap.

It is well known to those with ordinary skill in the art that the agglomerating particle matter in Hirth is to be collected in a trap so that the particle matter can be disposed of. Therefore, such disclosure by Hirth is notoriously well known in the art so as to be proper for official notice.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirth as applied to claim 1 above, in view of McQuigg et al. (U.S. Patent 6,530,978).

The method of Hirth discloses the invention as cited above, however, fails to disclose that the characteristic being altered is the temperature of the particulate matter.

As shown in Figure 1, McQuigg et al. teach a system to remove particulate matters from a gas stream comprising passing the gas stream through a indirect gas cooler (24) to reduce the temperature of the gas stream. In this way, the particulate matters, aerosol particles, and water agglomerate together which is then removed from the gas stream (see claim 1). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the gas cooler taught by McQuigg et al. in the method of Hirth, since the use

thereof would have provided an effective means to remove particulate matters in the exhaust gas stream.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirth as applied to claim 12 above, in view of legal precedent.

The apparatus of Hirth discloses the invention as cited above, however, fails to disclose that the positive electrode is configured to apply a positive voltage of at least 8 kV and the negative electrode is configured to apply a negative voltage of at least 7.5 kV.

Hirth disclose the claimed invention except for specifying optimum ranges of a positive voltage of at least 8 kV and a negative voltage of at least 7.5 kV applied to the positive electrode and negative electrode, respectively. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide specific optimum ranges of voltages to the positive electrode and negative electrode, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

6. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirth as applied to claims 15 and 17, respectively, above, in view of Yang (U.S. Patent 6,193,934).

The apparatus of Hirth discloses the invention as cited above, however, fails to specifically disclose that for grounding, a copper screen is utilized around the inner perimeters of the first and second exhaust conduits and around the inner perimeter of the combined exhaust gas passage.

As shown in Figure 3, Yang teaches an emission control system comprising a tubular dielectric barrier plasma reactor (52), is shaped in the form of coaxial cylinders with an inner

metal electrode (78) and an outer tube made of glass. A copper screen in contact with the surface of the tube serves as a ground electrode (80) (lines 34-36 of column 7). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the copper screen for grounding as taught by Yang in the apparatus of Hirth, since the use thereof would have provided an apparatus safe to touch.

Response to Arguments

7. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner has not established a case for *prima facie* obviousness by using Hirth to reject the base claims (page 2 of Applicant's Request for Reconsideration), the examiner respectfully disagrees.

In Hirth, there is no mention of the specific arts that his invention can be applied to. Hirth, however, discloses in the Background of the Invention that his invention is applied to the electrostatic dust filters to remove dust particles from a gas stream (see lines 16-46 of column 1). One with ordinary skill in the art of exhaust gas treatment immediately recognizes that an exhaust gas stream exiting from an internal combustion engine contains unburned particles such as soot and liquid hydrocarbon that are very harmful to the environment. Such particles must be removed from the exhaust gas stream before the clean exhaust gas can be released to the environment. Since an exhaust gas stream of an engine has the same two main ingredients, namely gaseous molecules and solid particles, that are required in Hirth, it is at least obvious to

one with ordinary skill in the art that the invention in Hirth is applied to an exhaust gas stream originating from an internal combustion engine.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communication

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tu M. Nguyen

TMN

January 19, 2006

Tu M. Nguyen

Primary Examiner

Art Unit 3748